

WHAT IS CLAIMED IS:

1. In a network switch including a plurality of processing engines, a method of coordinating the operation of the processing engines, comprising:
  - 5 receiving a request for a connection at the network switch;
  - assigning a semaphore to the connection;
  - storing the semaphore at the processing engines;
  - at one of the processing engines, receiving an internal message including a semaphore value;
- 10 comparing the stored semaphore to the semaphore value; and  
at the one of the processing engines, processing the internal message based on the comparison of the stored semaphore and the semaphore value.
2. The method of claim 1, further comprising:
  - 15 pre-loading a memory with a plurality of semaphores assignable to connections.
3. The method of claim 1, further comprising:
  - in the one of the processing engines, allocating resources to the connection if
  - 20 the stored semaphore is equal to the semaphore value.
4. The method of claim 1, further comprising:
  - in the one of the processing engines, de-allocating resources assigned to the connection if the stored semaphore is equal to the semaphore value.
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5. The method of claim 1, wherein the semaphore is a generation count.
6. The method of claim 5, further comprising:
  - terminating the connection;
  - 30 incrementing the generation count; and
  - storing the incremented generation count in a memory.
7. The method of claim 6, further comprising:

returning the incremented generation count to a first-in-first-out (FIFO) memory so that the incremented generation count is assignable to a subsequently received connection request.

- 5           8.       The method of claim 1, further comprising:  
generating an exception response based on the comparison of the stored semaphore and the semaphore value.
- 10          9.       A method of processing a packet received by a switch having a plurality of processors, comprising:  
at an origination processor, assigning a semaphore to an internal message associated with the packet;  
passing the internal message to another of the processors;  
performing processing operations relating to the packet at the another of the  
15         processors, based on the internal message; and  
returning to the origination processor a response including the semaphore, for indicating that the processing operations are completed.
- 20          10.      The method of claim 9, further comprising:  
upon receipt of the internal message at the another of the processors, allocating resources within the another of the processors for performing the processing operations.
- 25          11.      The method of claim 10, wherein the resources are shared.
- 30          12.      A network switch, comprising:  
a first processing engine for assigning a semaphore to one or more packets associated with a connection; and  
a second processing engine, in communication with the first processing engine, having a memory for storing the semaphore and an interface for receiving an internal message including a semaphore value, the second processing engine processing the packets based on a comparison of the stored semaphore and the semaphore value.

13. The network switch of claim 12, further comprising:  
a first-in-first-out (FIFO) memory, operatively associated with the first  
processing engine, for storing a plurality of semaphores assignable to a plurality of  
connections.

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14. The network switch of claim 13, further comprising:  
a central processing unit (CPU) configured to pre-load the FIFO  
memory with the semaphores.

10 15. The network switch of claim 12, wherein the second processing engine  
further comprises:

shared resources allocated for processing the packets if the stored semaphore is  
equal to the semaphore value.

15 16. The network switch of claim 12, wherein the semaphore is a generation  
count.

20 17. The network switch of claim 16, further comprising:  
means for terminating the connection;  
means for incrementing the generation count; and  
means for storing the incremented generation count in a FIFO memory.

25 18. The network switch of claim 16, further comprising:  
means for returning the incremented generation count to the FIFO  
memory so that the incremented generation count is assignable to a subsequently  
received connection request.

30 19. The network switch of claim 12, further comprising:  
means for generating an exception response based on the comparison of the  
stored semaphore and the semaphore value;

means for comparing the stored semaphore to the semaphore value; and means for processing the internal message or generating an exception response.